

# PATENT ABSTRACTS OF JAPAN

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(71)Applicant : MATSUSHITA ELECTRIC IND CO LTD

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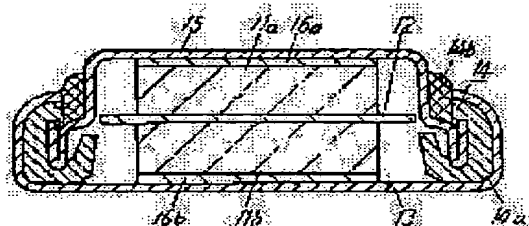
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## (54) ELECTRIC DOUBLE LAYER CAPACITOR

### (57)Abstract:

PURPOSE: To obtain an electric double layer capacitor excellent in sealing performance for sealing a metal case with a seal composed of a first seal member made of a material having a high heat resistance and second seal member made of a material having a high moisture resistance.

CONSTITUTION: A separator 12 is disposed between a pair of polarized electrodes 11a and 11b and impregnated with an electrolytic liq. These electrodes are housed in a dish-like metal case 13 acting as a collector and the opening of the case is sealed with a metal cover 15 i.e., the collector through a seal 14 composed of a seal member 14a made of an engineering plastic material having a high heat resistance and seal member 14b made of a butyl rubber having a high moisture resistance. Thus, an electric double layer capacitor excellent in sealing performance.



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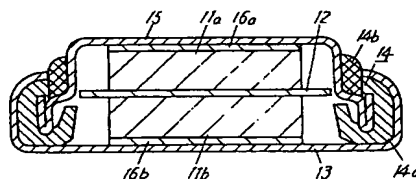
(54) 【発明の名称】 電気二重層コンデンサ

(57) 【要約】

【目的】 160℃以上の高温で数分間放置しても漏液することはなく、またこの高温放置後における熱衝撃試験でも漏液することのない封口性能の優れた電気二重層コンデンサを提供することを目的とする。

【構成】 一对の分極性電極11a, 11bと、この一对の分極性電極11a, 11bの間に介在されたセパレータ12と、このセパレータ12と前記一对の分極性電極11a, 11bに含浸された電解液と、前記一对の分極性電極11a, 11b、セパレータ12を収納する金属ケース13と、この金属ケース13を密封する封口体14とを有し、前記封口体14を耐熱性に富む材料により構成された第1の封口部材14aと耐湿性に富む材料により構成された第2の封口部材14bとにより構成したものである。

11a, 11b 一对の分極性電極  
12 セパレータ  
13 金属ケース  
14 封口体  
14a 第1の封口部材  
14b 第2の封口部材



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## 【特許請求の範囲】

【請求項1】 一対の分極性電極と、この一対の分極性電極の間に介在されたセパレータと、このセパレータと前記一対の分極性電極に含浸された電解液と、前記一対の分極性電極、セパレータを収納する金属ケースと、この金属ケースを密封する封口体とを有し、前記封口体を耐熱性に富む材料により構成された第1の封口部材と耐湿性に富む材料により構成された第2の封口部材とにより構成した電気二重層コンデンサ。

【請求項2】 第1の封口部材はエンジニアリングプラスチックで構成した請求項1記載の電気二重層コンデンサ。

【請求項3】 第2の封口部材はゴムで構成した請求項1記載の電気二重層コンデンサ。

【請求項4】 第2の封口部材は熱硬化性樹脂接着剤で構成した請求項1記載の電気二重層コンデンサ。

【請求項5】 第1の封口部材をエンジニアリングプラスチックで構成し、かつ第2の封口部材を熱硬化性樹脂接着剤で構成し、前記第2の封口部材を金属ケースの開口部に設置し、かつ第1の封口部材を第2の封口部材より内側に設置した請求項1記載の電気二重層コンデンサ。

【請求項6】 第1の封口部材をエンジニアリングプラスチックで構成し、かつ第2の封口部材をゴムで構成し、前記第2の封口部材を金属ケースの開口部に設置し、かつ第1の封口部材を第2の封口部材より内側に設置した請求項1記載の電気二重層コンデンサ。

【請求項7】 第1の封口部材をエンジニアリングプラスチックで構成し、かつ第2の封口部材をゴムで構成し、前記第1の封口部材を金属ケースの開口部に設置し、かつ第2の封口部材を第1の封口部材より内側に設置した請求項1記載の電気二重層コンデンサ。

## 【発明の詳細な説明】

## 【0001】

【産業上の利用分野】 本発明は各種電子機器に利用される電気二重層コンデンサに関するものである。

## 【0002】

【従来の技術】 従来のこの種の電気二重層コンデンサは、図3に示すような構造となっていた。すなわち、一対の分極性電極1a、1bと、この一対の分極性電極1a、1bの間に介在されたセパレータ2と、前記一対の分極性電極1a、1bとセパレータ2に含浸された電解液とを有し、そして前記一対の分極性電極1a、1bと皿状の金属ケース3および金属蓋4との間に集電層5a、5bを設け、さらに前記皿状の金属ケース3の開口部を封口体6を介して金属蓋4で密封することにより構成していた。また前記封口体6の材料としては、特開昭63-190320号公報においては、架橋性のポリプロピレンが単独で用いられていた。

## 【0003】

【発明が解決しようとする課題】 しかしながら、上記した従来の電気二重層コンデンサにおいて、封口体6の材料として架橋性ポリプロピレンを用いた場合は、160℃以上の高温で数分間放置すると瞬間的に応力緩和が起き、これにより、漏液したり、また、前記高温放置後における熱衝撃試験でも漏液するものがあつた。このように、上記した従来の電気二重層コンデンサは封口性能の面でありあまり芳しくないという問題点を有していた。

【0004】 本発明は上記従来の問題点を解決するもので、封口性能の優れた電気二重層コンデンサを提供することを目的とするものである。

## 【0005】

【課題を解決するための手段】 上記目的を達成するために本発明の電気二重層コンデンサは、一対の分極性電極と、この一対の分極性電極の間に介在されたセパレータと、このセパレータと前記一対の分極性電極に含浸された電解液と、前記一対の分極性電極、セパレータを収納する金属ケースと、この金属ケースを密封する封口体とを有し、前記封口体を耐熱性に富む材料により構成された第1の封口部材と耐湿性に富む材料により構成された第2の封口部材とにより構成したものである。

## 【0006】

【作用】 上記構成によれば、電気二重層コンデンサの封口体を耐熱性に富む材料により構成された第1の封口部材と耐湿性に富む材料により構成された第2の封口部材とで構成し、これら第1の封口部材と第2の封口部材を組み合わせた封口体を用いているため、電気二重層コンデンサを160℃以上の高温で数分間放置しても漏液することはなく、また前記高温放置後の熱衝撃試験でも漏液することはなく、これにより、封口性能の優れた電気二重層コンデンサが得られるものである。

## 【0007】

【実施例】 以下、本発明の実施例を図面を参照しながら説明する。

【0008】 図1は本発明の実施例1を示したもので、11a、11bは活性炭粉末からなる直径4.5mm、厚さ1.0mmの円柱状をなす一対の分極性電極で、この一対の分極性電極11a、11bの間にはセパレータ12を介在させている。また前記一対の分極性電極11a、11bとセパレータ12には10wt%のテトラエチルアンモニウムテトラフルオロボレーートをプロピレンカーボネートに溶解した電解液を含浸させている。

【0009】 また前記一対の分極性電極11a、11bは集電体である皿状の金属ケース13に収納しており、そして、この皿状の金属ケース13の開口部は、耐熱性に富む材料であるポリアミド系のナイロン46（エンジニアリングプラスチック）により構成された第1の封口部材14aと耐湿性に富む材料であるブチルゴムにより構成された第2の封口部材14bとにより構成した封口体14を介して集電体である金属蓋15により密封され

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ている。なお、前記第2の封口部材14bは皿状の金属ケース13の開口部に設置し、かつ第1の封口部材14aは第2の封口部材14bより内側に設置している。そしてまた、前記分極性電極11aと金属蓋15との間および分極性電極11bと皿状の金属ケース13との間には集電層16a、16bを設けている。

【0010】図2は本発明の実施例2を示したもので、21a、21bは活性炭粉末からなる直径4.5mm、厚さ1.0mmの円柱状をなす一対の分極性電極で、この一対の分極性電極21a、21bの間にはセパレータ22を介在させている。また前記一対の分極性電極21a、21bとセパレータ22には10wt%のテトラエチルアンモニウムテトラフルオロボレートをプロピレンカーボネートに溶解した電解液を含浸させている。

【0011】また前記一対の分極性電極21a、21bは集電体である皿状の金属ケース23に収納しており、そして、この皿状の金属ケース23の開口部は耐熱性に富む材料であるポリアミド系のナイロン46（エンジニアリングプラスチック）により構成された第1の封口部材24aと耐湿性に富む材料であるエポキシ系の熱硬化性樹脂接着剤により構成された第2の封口部材24bとにより構成された封口体24を介して集電体である金属

	液相160℃で2分間耐熱試験をした直後の漏液	液相160℃で2分間の耐熱試験後における熱衝撃試験（-30～+70℃各30分）100サイクル後の漏液
実施例1	0個/100個	0個/100個
実施例2	0個/100個	0個/100個
従来例	50個/100個	100個/100個

【0014】この（表1）から明らかなように、従来例では、液相160℃で2分間耐熱試験をした直後においては100個中50個の漏液が観察され、そして前記耐熱試験後における熱衝撃試験（-30～+70℃各30分）後においては全数100個とも漏液が観察されたのに対し、本発明の実施例1および2では、液相160℃で2分間耐熱試験をした直後の漏液と前記耐熱試験後における熱衝撃試験後の漏液は、100個中1個も観察されず、このように、本発明の実施例1および2においては従来例に比べて格段に封口性能が向上したため、液相160℃の高温で2分間放置しても封口性能が優れている電気二重層コンデンサとして使用できるものである。

【0015】なお、上記本発明の実施例1では、皿状の金属ケース13の開口部を、耐熱性に富む材料であるポリアミド系のナイロン46（エンジニアリングプラスチック）により構成された第1の封口部材14aと耐湿性に富む材料であるブチルゴムにより構成された第2の封口部材14bとにより構成した封口体14を介して集電体である金属蓋15により密封し、そして第2の封口部材14bを皿状の金属ケース13の開口部に設置し、か

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蓋25により密封されている。なお、前記第2の封口部材24bは皿状の金属ケース23の開口部に設置し、かつ第1の封口部材24aは第2の封口部材24bより内側に設置している。そしてまた、前記分極性電極21aと金属蓋25との間および分極性電極21bと皿状の金属ケース23との間には集電層26a、26bを設けている。

【0012】（表1）は電気二重層コンデンサの封口体として、第1の封口部材14aにポリアミド系のナイロン46（エンジニアリングプラスチック）を、第2の封口部材14bにブチルゴムを用いた本発明の実施例1と、第1の封口部材24aにポリアミド系のナイロン46（エンジニアリングプラスチック）を、第2の封口部材24bにエポキシ系の熱硬化性樹脂接着剤を用いた本発明の実施例2と、封口部材に架橋性ポリプロピレンを用いた従来例のそれぞれについて、液相160℃で2分間耐熱試験をした直後の漏液と前記耐熱試験後における熱衝撃試験（-30～+70℃各30分）後の漏液の結果を示したものである。

【0013】

【表1】

つ第1の封口部材14aを第2の封口部材14bより内側に設置したものについて説明したが、これとは逆に、第1の封口部材14aを皿状の金属ケース13の開口部に設置し、かつ第2の封口部材14bを第1の封口部材14aより内側に設置した場合においても、上記本発明の実施例1と同様の効果が得られるものである。

【0016】また、上記本発明の実施例1および2においては、コイン形の電気二重層コンデンサについて説明したが、このコイン形に限定されるものではなく、捲回形の電気二重層コンデンサにも、本発明の実施例1および2は適用できるものである。

【0017】

【発明の効果】以上のように本発明の電気二重層コンデンサは、一対の分極性電極と、この一対の分極性電極の間に介在されたセパレータと、このセパレータと前記一対の分極性電極に含浸された電解液と、前記一対の分極性電極、セパレータを収納する金属ケースと、この金属ケースを密封する封口体とを有し、前記封口体を耐熱性に富む材料により構成された第1の封口部材と耐湿性に富む材料により構成された第2の封口部材とで構成し、

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これら第1の封口部材と第2の封口部材を組み合わせた封口体を用いているため、電気二重層コンデンサを160℃以上の高温で数分間放置しても、漏液することはない、また前記高温放置後の熱衝撃試験でも漏液することはない、これにより、封口性能の優れた電気二重層コンデンサが得られ、実用上極めて有利となるものである。

【図面の簡単な説明】

【図1】本発明の実施例1を示す電気二重層コンデンサの断面図

【図2】本発明の実施例2を示す電気二重層コンデンサの断面図

【図3】従来の電気二重層コンデンサを示す断面図

【符号の説明】

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11a, 11b 一对の分極性電極

12 セパレータ

13 皿状の金属ケース

14 封口体

14a 第1の封口部材

14b 第2の封口部材

21a, 21b 一对の分極性電極

22 セパレータ

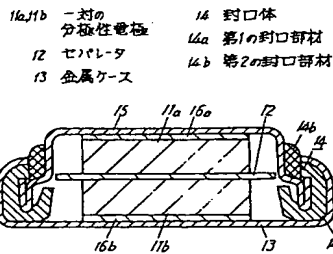
23 皿状の金属ケース

24 封口体

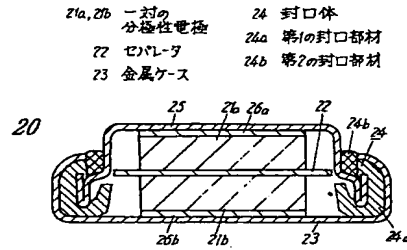
24a 第1の封口部材

24b 第2の封口部材

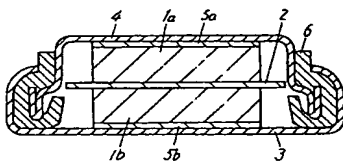
【図1】



【図2】



【図3】



フロントページの続き

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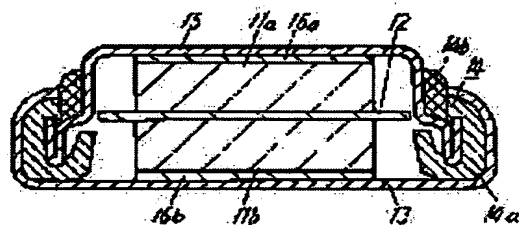
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## (57)Abstract:

PURPOSE: To obtain an electric double layer capacitor excellent in sealing performance for sealing a a metal case with a seal composed of a first seal member made of a material having a high heat resistance and second seal member made of a material having a high moisture resistance.

CONSTITUTION: A separator 12 is disposed between a pair of polarized electrodes 11a and 11b and impregnated with an electrolytic liq. These electrodes are housed in a dish-like metal case 13 acting as a collector and the opening of the case is sealed with a metal cover 15 i.e., the collector through a seal 14 composed of a seal member 14a made of an engineering plastic material having a high heat resistance and seal member 14b made of a butyl rubber having a high moisture resistance. Thus, an electric double layer capacitor excellent in sealing performance.



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CLAIMS

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[Claim(s)]

[Claim 1] The separator which intervened between the polarizable electrode of a couple, and the polarizable electrode of this couple, The electrolytic solution by which impregnation was carried out to the polarizable electrode of this separator and said couple, and the polarizable electrode of said couple and metal casing which contains a separator, The electric double layer capacitor which has the obturation object which seals this metal casing, and constituted said obturation object by the 1st obturation member constituted with the ingredient which is rich in thermal resistance, and the 2nd obturation member constituted with the ingredient which is rich in moisture resistance.

[Claim 2] The 1st obturation member is the electric double layer capacitor according to claim 1 constituted from engineering plastics.

[Claim 3] The 2nd obturation member is the electric double layer capacitor according to claim 1 constituted from rubber.

[Claim 4] The 2nd obturation member is the electric double layer capacitor according to claim 1 constituted from thermosetting resin adhesive.

[Claim 5] The electric double layer capacitor according to claim 1 which constituted the 1st obturation member from engineering plastics, and constituted the 2nd obturation member from thermosetting resin adhesive, and installed said 2nd obturation member in opening of metal casing, and installed the 1st obturation member inside the 2nd obturation member.

[Claim 6] The electric double layer capacitor according to claim 1 which constituted the 1st obturation member from engineering plastics, and constituted the 2nd obturation member from rubber, and installed said 2nd obturation member in opening of metal casing, and installed the 1st obturation member inside the 2nd obturation member.

[Claim 7] The electric double layer capacitor according to claim 1 which constituted the 1st obturation member from engineering plastics, and constituted the 2nd obturation member from rubber, and installed said 1st obturation member in opening of metal casing, and installed the 2nd obturation member inside the 1st obturation member.

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[Translation done.]

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DETAILED DESCRIPTION

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## [Detailed Description of the Invention]

[0001]

[Industrial Application] This invention relates to the electric double layer capacitor used for various electronic equipment.

[0002]

[Description of the Prior Art] This conventional kind of electric double layer capacitor had become structure as shown in drawing 3. Namely, the separator 2 which intervened between the polarizable electrodes 1a and 1b of a couple, and the polarizable electrodes 1a and 1b of this couple, It has the electrolytic solution by which impregnation was carried out to the polarizable electrodes 1a and 1b and separator 2 of said couple. And the current collection layers 5a and 5b were formed between the polarizable electrodes 1a and 1b of said couple, the dished metal casing 3, and the metal lid 4, and it constituted by sealing opening of said dished metal casing 3 with the metal lid 4 through the obturation object 6 further. Moreover, as an ingredient of said obturation object 6, the polypropylene of cross-linking was independently used in JP,63-190320,A.

[0003]

[Problem(s) to be Solved by the Invention] However, in the above-mentioned conventional electric double layer capacitor, when cross-linking polypropylene was used as an ingredient of the obturation object 6, when it was left for several minutes at the elevated temperature 160 degrees C or more, stress relaxation broke out momentarily, it spilt liquid and there were some to which the spalling test after said elevated-temperature neglect also spills liquid by this. Thus, it had the trouble that the above-mentioned conventional electric double layer capacitor was not much fragrant in respect of the obturation engine performance.

[0004] This invention solves the above-mentioned conventional trouble, and it aims at offering the electric double layer capacitor which was excellent in the obturation engine performance.

[0005]

[Means for Solving the Problem] In order to attain the above-mentioned object the electric double layer capacitor of this invention The separator which intervened between the polarizable electrode of a couple, and the polarizable electrode of this couple, The electrolytic solution by which impregnation was carried out to the polarizable electrode of this separator and said couple, and the polarizable electrode of said couple and metal casing which contains a separator, It has the obturation object which seals this metal casing, and the 1st obturation member constituted with the ingredient which is rich in thermal resistance, and the 2nd obturation member constituted with the ingredient which is rich in moisture resistance constitute said obturation object.

[0006]

[Function] According to the above-mentioned configuration, the obturation object of an electric double layer capacitor is constituted from the 1st obturation member constituted with the ingredient which is rich in thermal resistance, and the 2nd obturation member constituted with the ingredient which is rich in moisture resistance. Since the obturation object which combined the obturation member of these 1st and the 2nd obturation member is used, The electric double layer capacitor which did not spill liquid even if it left the electric double layer capacitor for several minutes at the elevated temperature 160 degrees C or more, and the spalling test after said elevated-temperature neglect did not spill liquid, either, and was excellent in the obturation engine performance by this is obtained.

[0007]

[Example] Hereafter, the example of this invention is explained, referring to a drawing.

[0008] Drawing 1 is what showed the example 1 of this invention, and 11a and 11b are the polarizable electrodes of the couple which makes the shape of a cylinder with a diameter [ of 4.5mm ], and a thickness of 1.0mm which consists of activated carbon powder, and are making the separator 12 intervene among the polarizable electrodes 11a and 11b of this couple. Moreover, the polarizable electrodes 11a and 11b and separator 12 of said couple are made to carry out impregnation of the electrolytic solution which dissolved 10wt(s)% tetraethylammonium tetrafluoroborate in propylene carbonate.

[0009] The polarizable electrodes 11a and 11b of said couple are contained to the dished metal casing 13 which is a charge collector. Moreover, and opening of this dished metal casing 13 By Nylon 46 (engineering plastics) of the polyamide system which is the ingredient which is rich in thermal resistance It is sealed with the metal lid 15 which is a charge collector through the obturation object 14 constituted by 1st constituted obturation member 14a and 2nd obturation member 14b constituted by the isobutylene isoprene rubber which is the ingredient which is rich in moisture resistance. In addition, said 2nd obturation member 14b is installed in opening of the dished metal casing 13, and 1st obturation member 14a is installed inside 2nd obturation member 14b. And between said polarizable electrode 11a and metal lids 15 and between polarizable electrode 11b and the dished metal casing 13, the current collection layers 16a and 16b are formed again.

[0010] Drawing 2 is what showed the example 2 of this invention, and 21a and 21b are the polarizable electrodes of the couple which makes the shape of a cylinder with a diameter [ of 4.5mm ], and a thickness of 1.0mm which consists of activated carbon powder, and are making the separator 22 intervene among the polarizable electrodes 21a and 21b of this couple. Moreover, the polarizable electrodes 21a and 21b and separator 22 of said couple are made to carry out impregnation of the electrolytic solution which dissolved 10wt(s)% tetraethylammonium tetrafluoroborate in propylene carbonate.

[0011] Moreover, the polarizable electrodes 21a and 21b of said couple are contained to the dished metal casing 23 which is a charge collector. Opening of this dished metal casing 23 by Nylon 46 (engineering plastics) of the polyamide system which is the ingredient which is rich in thermal resistance It is sealed with the metal lid 25 which is a charge collector through the obturation object 24 constituted by 2nd obturation member 24b constituted by the thermosetting resin adhesive of the epoxy system which is the ingredient which is rich in 1st constituted obturation member 24a and moisture resistance. In addition, said 2nd obturation member 24b is installed in opening of the dished metal casing 23, and 1st obturation member 24a is installed inside 2nd obturation member 24b. And between said polarizable electrode 21a and metal lids 25 and between polarizable electrode 21b and the dished metal casing 23, the

current collection layers 26a and 26b are formed again.

[0012] The example 1 of this invention to which (a table 1) used Nylon 46 (engineering plastics) of a polyamide system for 1st obturation member 14a, and used isobutylene isoprene rubber for 2nd obturation member 14b as an obturation object of an electric double layer capacitor, The example 2 of this invention which used Nylon 46 (engineering plastics) of a polyamide system for 1st obturation member 24a, and used the thermosetting resin adhesive of an epoxy system for 2nd obturation member 24b, About each of the conventional example which used cross-linking polypropylene for the obturation member, the result of a liquid spill immediately after carrying out a heat test for 2 minutes at 160 degrees C of liquid phase and the liquid spill after the spalling test after said heat test (-30-+70-degree-C 30 minutes each) is shown.

[0013]

[A table 1]

	液相 160℃で2分間耐熱試験をした直後の漏液	液相 160℃で2分間の耐熱試験後における熱衝撃試験 (-30~+70℃各30分) 100サイクル後の漏液
実施例 1	0個/100個	0個/100個
実施例 2	0個/100個	0個/100個
従来例	50個/100個	100個/100個

[0014] this (table 1) -- from -- in the conventional example so that clearly 50 liquid spills are observed among 100 pieces immediately after carrying out a heat test for 2 minutes at 160 degrees C of liquid phase. As opposed to the liquid spill having been observed for all 100 total after the spalling test after said heat test (-30-+70-degree-C 30 minutes each) and in the examples 1 and 2 of this invention A liquid spill immediately after carrying out a heat test for 2 minutes at 160 degrees C of liquid phase, and the liquid spill after the spalling test after said heat test one piece is not observed among 100 pieces, either, but since it was markedly alike compared with the conventional example in the examples 1 and 2 of this invention and the obturation engine performance improved in this way, even if it leaves it for 2 minutes at the elevated temperature which is 160 degrees C of liquid phase, it can be used as an electric double layer capacitor excellent in the obturation engine performance.

[0015] In the example 1 of above-mentioned this invention, in addition, opening of the dished metal casing 13 By Nylon 46 (engineering plastics) of the polyamide system which is the ingredient which is rich in thermal resistance It seals with the metal lid 15 which is a charge collector through the obturation object 14 constituted by 1st constituted obturation member 14a and 2nd obturation member 14b constituted by the isobutylene isoprene rubber which is the ingredient which is rich in moisture resistance. And although what installed 2nd obturation member 14b in opening of the dished metal casing 13, and installed 1st obturation member 14a inside 2nd obturation member 14b was explained When this installs 1st obturation member 14a in opening of the dished metal casing 13 and installs 2nd obturation member 14b in reverse inside 1st obturation member 14a, the same effectiveness as the example 1 of above-mentioned this invention is acquired.

[0016] Moreover, in the examples 1 and 2 of above-mentioned this invention, although the electric double layer capacitor of a coin form was explained, it is not limited to this coin form and the examples 1 and 2 of this invention can be applied also to the electric double layer capacitor of a winding form.

[0017]

[Effect of the Invention] As mentioned above the electric double layer capacitor of this invention The separator which intervened between the polarizable electrode of a couple, and the polarizable electrode of this couple, The electrolytic solution by which impregnation was carried out to the polarizable electrode of this separator and said couple, and the polarizable electrode of said couple and metal casing which contains a separator, Have the obturation object which seals this metal casing, and said obturation object is constituted from the 1st obturation member constituted with the ingredient which is rich in thermal resistance, and the 2nd obturation member constituted with the ingredient which is rich in moisture resistance. Since the obturation object which combined the obturation member of these 1st and the 2nd obturation member is used, Even if it leaves an electric double layer capacitor for several minutes at an elevated temperature 160 degrees C or more, the electric double layer capacitor which did not spill liquid, and the spalling test after said elevated-temperature neglect did not spill liquid, either, and was excellent in the obturation engine performance by this is obtained, and it becomes practically very advantageous.

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DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1] The sectional view of the electric double layer capacitor in which the example 1 of this invention is shown

[Drawing 2] The sectional view of the electric double layer capacitor in which the example 2 of this invention is shown

[Drawing 3] The sectional view showing the conventional electric double layer capacitor

[Description of Notations]

11a, 11b Polarizable electrode of a couple

12 Separator

13 Dished Metal Casing

14 Obturation Object

14a The 1st obturation member

14b The 2nd obturation member

21a, 21b Polarizable electrode of a couple

22 Separator

23 Dished Metal Casing

24 Obturation Object

24a The 1st obturation member

24b The 2nd obturation member

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[Translation done.]

## \* NOTICES \*

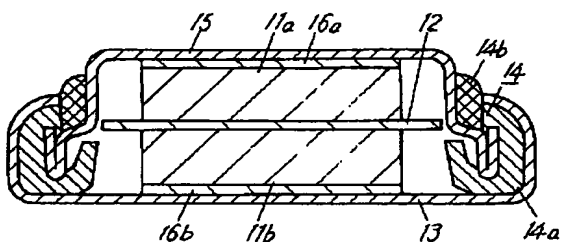
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## DRAWINGS

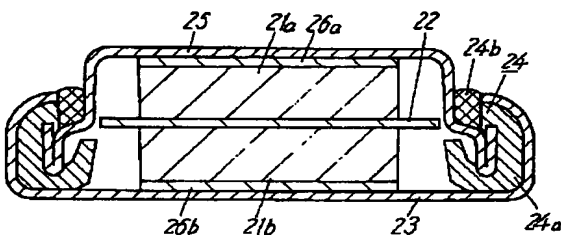
[Drawing 1]

- |          |              |     |         |
|----------|--------------|-----|---------|
| 11a, 11b | 一対の<br>分極性電極 | 14  | 封口体     |
| 12       | セパレータ        | 14a | 第1の封口部材 |
| 13       | 金属ケース        | 14b | 第2の封口部材 |

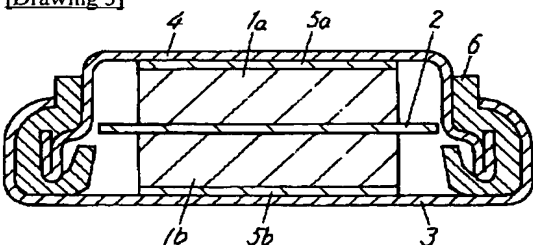


[Drawing 2]

- |          |              |     |         |
|----------|--------------|-----|---------|
| 21a, 21b | 一対の<br>分極性電極 | 24  | 封口体     |
| 22       | セパレータ        | 24a | 第1の封口部材 |
| 23       | 金属ケース        | 24b | 第2の封口部材 |



[Drawing 3]



[Translation done.]

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